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November 22, 1958

VOL. 74 NO. 21 PAGES 321-336

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE

Palaimon's Temple

See page 323

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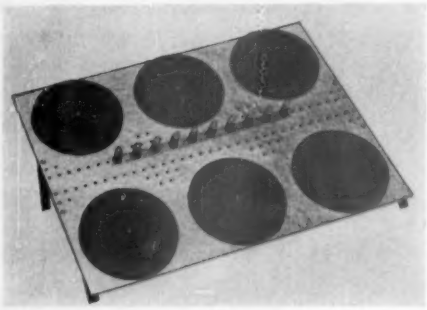

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BIOCHEMISTRY

Study Chemical Imbalance

The balance between cholinesterase and acetylcholine, two chemicals found in the brain, apparently influences an animal's ability to learn.

➤ CAPACITY for learning may be governed by the balance of two chemicals in the brain.

The chemicals, known as cholinesterase and acetylcholine, have various effects on man and animals depending on their concentrations in the brain.

Studies by two psychologists and a biochemist at the University of California, Berkeley, point to a possible relationship between the amount of cholinesterase activity in the brains of rats and the ability of the animals to learn their way around in a maze.

The psychologists, Drs. David Krech and Mark R. Rosenzweig, and the biochemist, Dr. Edward L. Bennett, reported at the National Academy of Sciences meeting in Berkeley, Calif., that "maze-bright" rats had significantly higher cholinesterase activity than did "maze-dull" rats. (See p. 324.)

To determine whether their observations were merely chance, the scientists cross-bred the bright and dull rats and performed similar experiments with the offspring. Results indicated that while there is a definite learning-cholinesterase relationship, it is not a simple linear one in which increase in one is followed by increase in the other.

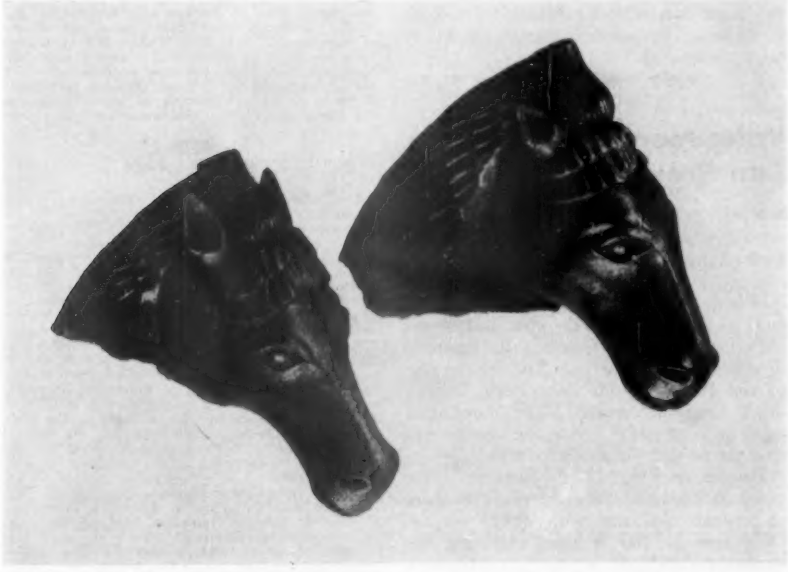
Drs. Krech, Rosenzweig and Bennett suggested that learning capacity has some dependency on the balance between cholinesterase and acetylcholine.

Both chemicals are widely but unevenly distributed in the central nervous systems of animals. The activity of acetylcholine in the cerebral cortex (that part of the brain which is most massive in man) is less in the human than in lower animals. The farther down the evolutionary scale the animal is, the greater is the acetylcholine activity. On the other hand, cholinesterase is most active in man's cortex.

Previous studies by other scientists have shown cholinesterase injections into the human brain can in some cases temporarily relieve the symptoms of schizophrenia, a severe mental disorder. Dr. Stephen L. Sherwood, Middlesex Hospital, London; Drs. Warren S. McCulloch and P. M. Cooke and Miss Ellen Ridley, University of Illinois College of Medicine, Chicago; and Drs. W. H. Mosberg, T. N. Tausig and A. P. Bay, Illinois State Hospital for Mental Diseases, Manteno, Ill., conducted the research in these phases.

The reduction of cholinesterase in rats in still other experiments has resulted in no change at first, then improved performance, then rapid loss in efficiency, and finally convulsions and death. This work was done by Dr. Roger W. Russell, executive secretary, American Psychological Association, at University College, London.

Science News Letter, November 22, 1958



ANCIENT HORSES—Two bronze heads of horses in an excellent state of preservation were removed from the "east dump" section of the excavations. They were made toward the end of the 6th century B.C. and had probably been dedicated to Poseidon who was god of horsemanship as well as of the sea. These are among the finest specimens of Greek archaic art.

ARCHAEOLOGY

Greek Ruins Bare Clues To "Mystery Religion"

See Front Cover

➤ A STRANGE pit containing evidence of a pre-Christian "mystery religion" has been discovered in Greece by a University of Chicago expedition.

Oscar Broneer, field director of the team of archaeologists, said he and his son, John W., also found an ancient wall used for defense against invaders 3,200 years ago. The father and son discovered the wall near Corinth.

Cut in native rock, the pit is 15 feet wide and extends to an unknown depth. Excavations turned up tiny figures of horses, a porpoise, and other tokens of bronze and gold, believed to have been gifts to the gods.

Judging from the piles of beakers and miscellaneous pottery, including oil lamps unique in Greece, Mr. Broneer believes the early Greeks used the site for "intense nighttime ritual." The pit is estimated to date from the 6th and 5th centuries B.C. It was found 55 miles west of Athens on the Isthmus of Corinth.

The wall is near a canal which cuts across the Isthmus. Mr. Broneer said that from its construction, the barrier was probably erected by the Achaean rulers of the Peloponnese at the end of the Bronze Age to halt hostile raids.

Although it may have withstood the attacks for a century, the aggressors finally broke through in what is known as the Dorian invasion.

Ironically, Dr. Broneer said, the end of the Isthmian temple installations occurred when soldiers of the Emperor Justinian in the 6th century A.D. broke down the pagan structures and used the material for a new wall to defend the Peloponnese against another surge of invaders from the north.

Other archaeological work in the area sponsored by the University since 1952 has discovered a temple to Poseidon, god of the sea, and a temple to Palaimon, a boy-god worshiped by early Greeks.

The photograph on the cover of this week's SCIENCE NEWS LETTER shows the foundation for the temple of the boy-god Palaimon. Through the foundation runs an underground passage which formed a crypt. Here it was customary for men, probably the Isthmian athletes, to descend to take their oaths in the name of the god. Dire punishment awaited those who perjured themselves, Dr. Broneer reported.

The east and north sides of the precinct of Poseidon remain to be cleared and excavation in the theater has barely begun, Dr. Broneer said. Other buildings at greater distances from the main sanctuary are the temples of Demeter and Kore, Artemis, Dionysus, and Euteria.

Science News Letter, November 22, 1958

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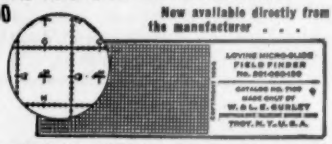

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BIOCHEMISTRY

Study Proteins in "Chain of Life" Mitosis

➤ THE DELICATE "mitotic apparatus" found in dividing cells has been isolated from sea urchin eggs and is currently being studied in an attempt to learn more about its production and reproduction in the "chain of life."

(The process by which a cell divides to form new cells is called mitosis. By means of mitosis "daughter" cells receive nuclear material identical with the "mother" cell.)

Already scientists have found that 10% of all the protein in the cells goes into the complete mitotic apparatus, abbreviated MA, Dr. Daniel Mazia of the University of California reported to the National Academy of Sciences meeting in Berkeley, Calif. Further tests point to the presence of ribonucleic acid and indicate that MA is made up mostly of only one species of protein. The major protein component has an average molecular weight of about 315,000.

Isolated MA remained stable only in the presence of a sulfur-containing compound dithiodiglycol, Dr. Mazia said. This is believed to be important proof that sulfur-sulfur bonds play a decisive role in the formation of the mitotic apparatus. Finding that excess mercaptoethanol penetrated the cell wall and blocked mitosis was additional evidence of the importance of sulfur bonds, Dr. Mazia said.

However, he pointed out, the block could be reversed and the mitotic divisions resumed as under normal conditions.

On the basis of these and other studies, Dr. Mazia explained, it appears that the proteins found in the mitotic apparatus are already formed before the cell divides and then are assembled at division. Even when the MA cannot function, he said, its reproduction continues as though conditions were normal.

Science News Letter, November 22, 1958

MEDICINE

Volunteers Show Vaccine Can Prevent Colds

➤ THE COMMON COLD can be prevented, a British scientist reported to the sixth annual Symposium on Antibiotics meeting in Washington, D. C.

Weekly injections of a vaccine prepared from the volunteer's own nose and throat bacteria significantly reduced the number of colds, Dr. J. Morrison Ritchie, director of the Public Health Laboratory, Birkenhead, England, reported. The number of colds in those not receiving the vaccine was five times that in the vaccinated.

Further tests, in which volunteers were given antibiotic tablets or lozenges in order to prevent colds, met with similar success. Only four in 100 of those receiving the antibiotic developed all the manifestations of the complicated cold, Dr. Ritchie said, as compared to 26 out of 100 of the control volunteers.

He reports oxytetracycline was the antibiotic used in the lozenge form. Sensitivity tests had showed the tetracyclines as a group were the most suitable for this purpose.

During the winter of 1957-58, 1,120 volunteers were tested with the cold-prevention treatment. Only 6.2 per 100 of those on the antibiotic developed significant symptoms. Severe "nasopharyngitis," or inflammation of the pharnyx above the soft palate, developed in 22.7 per 100 of those in the control group.

The form of cold prevention, Dr. Ritchie said, did not give rise to an increased number of antibiotic-resistant strains. The economies effected by such control measures are obvious, he concludes.

Science News Letter, November 22, 1958

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METEOROLOGY

Predict Rain Modification

A representative group of the nation's meteorologists has responded in the affirmative to a Science Service inquiry concerning man's ability to modify the weather.

➤ IN TEN TO 50 years it will be possible for mankind to increase or decrease precipitation, prevent hail and prevent lightning.

This is the opinion of weathermen selected from the membership of the American Meteorological Society and asked to answer, anonymously, questions in a SCIENCE SERVICE Grand Jury inquiry. Approximately two percent of the 2,500 professional members were chosen methodically and polled to give a good distribution throughout the nation. Nearly three-quarters responded.

There was an overwhelming affirmative answer to the question: "Is it possible for mankind to increase or decrease precipitation, prevent hail, prevent lightning?" Within ten years was the time judgment of 42% (18) and within 50 years said 37% (16). Only 9% (4) said 100 years or never, while 12% (5) did not vote.

As to man's potential control of severe storms, such as squall lines, tornadoes, and hurricanes, 46% (20) believed that this would be possible in 50 years, while 5% (2) were so optimistic as to believe this possible in ten years. Within 100 years was the opinion of 19% (8), while 16% (7) said "never" and 14% (6) did not vote.

The possibility of the control of large-scale weather patterns was deemed possible within 50 years by 30% (13) and within ten years by 5% (2). The judgment of 19% (8) was such control will come within 100 years, while 30% (13) said "never" and 16% (7) did not vote.

Expert comment on the rainmaking attempts over the past couple of decades was obtained. Only 16% (7) of the experts were willing to say that there has been improvement in the present status of increasing or decreasing precipitation by seeding with water or other chemicals. However, 54% (23) believed that this prospect has improved. Only 7% (3) considered rainmaking proved, and 23% (10) did not vote on this question.

Large sources of energy might be used in modifying weather, but one expert said that "at present we have no energy sources or energy 'reflectors' available which give a remote promise of control of large-scale weather phenomena" and that "the present system of 'trigger forces' is not the answer to the modification of large-scale weather control."

Another opinion was more pessimistic: "Man will always have more demanding uses for the large amounts of energy required."

"Within 50 years," another meteorologist declared, "we shall understand the mechanisms of weather and climate well enough, and have control over sufficiently large supplies of energy, to produce appreciable modifications in, but not control over, weather and climate phenomena."

Changes in topography, such as the Russian proposal to create a huge inland sea, will produce some changes in the general circulation of the atmosphere, another weatherman foresees, but this is weather change not "control."

Increasing precipitation, in another opinion, is a problem of purifying air, not contaminating air by seeding.

One meteorologist doubts that the legal problems in weather modification and control will be as readily solved as the scientific and technical ones.

Predictions are not possible, in another judgment, because "it is impossible to set a timetable for the break-throughs of science."

Research Support Needed

Greatly increased support for research and development of weather control would be justified because such control would be so valuable economically, another meteorologist argued. However, to date, in his opinion the possibilities have been beclouded by premature claims and in many cases outright misrepresentation.

"Possibilities are much more limited than press accounts have led the public to believe," this expert continued, "but the possibilities are nevertheless likely to be very important. Progress will come more rapidly if science and the public take a more sober and deliberate approach to fundamental research in this field."

Money can buy progress, another expert suggested, since he believes that unless research investments are drastically increased to $10,000,000 to $20,000,000 annually, 50 years is a fair timetable for weather control. He suggests that the program should have the same priority as guided missiles, satellites and rockets.

"The consequences of the achievement of weather control are so great," said another expert, "that we have no alternative but to proceed immediately with the fundamental research which will provide information necessary for a definitive experiment."

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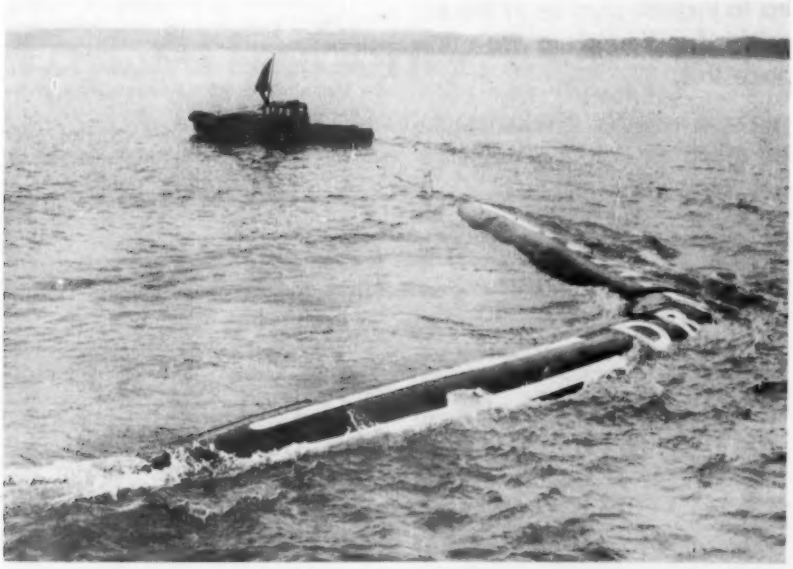

OIL TANKER—A new type British oil tanker is the flexible sausage-shaped barge called Dracone. Capable of carrying about 40 tons of kerosene, it is a huge tubular skin of woven nylon fabric impregnated with rubber. Dracone is said to be impervious to oil on the inside and to sunshine and salt water on the outside. Invented by Prof. W. R. Hawthorne and developed by Dracone Development Ltd., the 100-footer is five feet in diameter and can carry solids.

● RADIO

Saturday, Nov. 29, 1958, 1:35-1:50 p.m. EST.

"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio network. Check your local CBS station.

Dr. Amel R. Menotti, vice president and scientific director of Bristol Laboratories, Syracuse, N. Y. will discuss "Antibiotics Conquer Diseases."

MEDICINE

Alcohol Absorption Varies

➤ NEITHER THE SIZE of the tipler nor the amount consumed determines the degree of intoxication.

It is the rates of absorption and elimination of alcohol in the bloodstream that determine whether the drinker is "tipsy" or not, three investigators report to a Committee on Medicolegal Problems in the *Journal of the American Medical Association* (Nov. 8).

Furthermore, that sobering-up period that occurs when a policeman or doctor appears quickly vanishes and the intoxication returns, Dr. Herman A. Heise of Milwaukee, Wis., Dr. Clarence W. Muehlberger of Lansing, Mich., and Ralph F. Turner of East Lansing, Mich., point out.

The fast sobering period is caused by an abundant secretion of epinephrine from the suprarenal glands located above the kidneys. It temporarily counteracts the effect of alcohol but not the percentage in body fluid. When the emergency has passed, intoxication returns without additional alcohol.

Actually, alcohol affects persons in a surprisingly uniform manner if the amount of alcohol accumulated in the body fluids is measured, not the amount consumed.

The threshold for measurable effects of alcohol usually occurs at a blood alcohol level of approximately 0.02% to 0.03% (indicating the accumulation of 0.4 ounce to 0.6 ounce of pure alcohol in a 150-pound person). In addition, the fatal dose of alcohol, a blood accumulation of 12 ounces, applies to anyone. At that level, the alcohol interferes with the basic nerve functions and death ensues.

This information has been accumulated in order to establish recommendations from the American Medical Association and the National Safety Council. The scientists conclude that: persons with a concentration of alcohol of less than 0.05% by weight in blood or its equivalent in urine, saliva or breath should not be prosecuted for driving while under the influence of alcohol; alcoholic influence is usually present in that percentage between 0.05% and 0.15%. This is a wide range and the committees recommended that courts of law consider behavior of the individual and circumstances leading to the arrest before making a decision; at 0.15% or over, there is definite evidence that the person is under the influence of alcohol.

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ASTRONAUTICS

Study Space Men

Plans for space travel need to include studies of the effects of space on man, ranging from his food needs to radiation and man's mental reactions to space life.

➤ CREW MEMBERS of manned space craft may be required to develop an appetite for slugs and snails.

These tempting delicacies would offer a more varied menu on long space flights that employ the use of a closed algal cycle for oxygen and food supplies, Dr. Robert G. Tischer, bacteriologist at Mississippi State University, said at the Second International Symposium on the Physics and Medicine of the Upper Atmosphere and Space held at San Antonio, Tex.

A space crew that depends upon a growing algae system for food will not necessarily welcome the prospects of eating the algae directly. Therefore, by placing an algae-eating animal such as a goat, daphnia, slug, snail or other animal within the space craft, the crew can obtain animal protein food in a form more familiar and desirable, the biologist explained.

Research in the field of such closed feeding systems must provide crewmen with a diet that is not only practical but possible, two U. S. Air Force Space Medicine scientists added. It is reasonable to presume that men will need more than algae cake or chemical porridges for space flight rations, Drs. George R. Steinkamp and Willard R. Hawkins of the School of Aviation Medicine at Randolph Air Force Base pointed out.

A truly long space flight such as a trip to Mars would take from two and one-half to three years. A steady diet of algae for that length of time would be undesirable.

Crew Minds Dulled

➤ THE "ALL work and no play" maxim holds true even in space flight.

For the detachment, confinement and sensory deprivation that will be experienced by man in space flight will affect his psychological processes. Dr. George T. Hauty, psychologist in the space medicine division of the School of Aviation Medicine, Randolph Air Force Base, reported at the symposium.

Experiments with men confined within an artificial space cabin for seven days revealed that when they were required to do a simple task the greater portion of the time, they exhibited symptoms of hallucinations and became "muddled."

Isolation, in which man is separated from his accustomed environment, produced anxiety, fear and/or indifference, Dr. Hauty explained.

The space crew will face the problem of fatigue due to simple tasks that are performed in a small space. Researchers have found that men confined in such small spaces do not adjust to the extreme turnabout of the normal day-night cycle. The men could not banish their feeling of fatigue and this led to a decline in ability to perform simple tasks.

The main problem of fatigue that overcomes the man in space flight is not the traditional "dragged out feeling" from hauling 1,000 pounds for 30 miles on foot. Rather, it stems from the association with a loss or lack of sleep or long concentration on a monotonous job.

This leads to bad judgment, slower decision time, a decline in alertness and vigilance, increased variability of reliability, and degradation of attitudes and feelings, Dr. Hauty pointed out.

Increased Radiation

➤ PILOTS AND CREWMEN on today's and tomorrow's high-flying commercial jets will receive somewhat increased but not intolerable doses of radiation, two scientists said at the Space Symposium.

The flight altitude of these planes is about 35,000 feet, Drs. Hermann J. Schaefer, U. S. Naval School of Aviation Medicine, Pensacola, and Abner Golden, department of pathology, Emory University Medical School, Emory, Ga., pointed out.

Commercial airline pilots who fly the upper limit of 1,000 hours a year would receive a yearly exposure of 250 millirad, they said. The yearly dose at sea level from natural background radiation ranges from 100 to 200 millirad, depending on location. It is lowest over the ocean and highest over igneous rock.

In other words, the additional exposure for a commercial jet pilot amounts to about twice the natural dose.

However, the scientists asserted, this amount is still within the maximum permissible dosage.

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PHARMACOLOGY

Retarded Boys Improved by Drug

➤ IMPRESSIVE physical and mental changes in sexually immature, mentally retarded boys following treatment with a new drug has been reported.

The drug, called Follutein, or Squibb Chorionic Gonadotropin, was administered to 32 mentally defective in-patients who were nine to 16 years of age, Drs. M. Reiss and H. H. Berman of the Willowbrook State School, Staten Island, reported to the Eastern State Psychiatric Association meeting in New York.

Treatment was continued for at least three months. Advances in physical development with Follutein in this study included increase in the size of the genitals. Weight and height increased and the standard I.Q. score of the treated boys improved 15% during the three months of therapy.

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BIOCHEMISTRY

Cells' DNA Replaced

Deoxyribonucleic acid, the mystery chemical essential to inheritance, can be replaced in its cell functioning by certain negatively charged molecules.

➤ OTHER CHEMICALS can substitute for DNA, the mystery chemical compound that plays an essential life role in transmitting hereditary characteristics.

An electrically negative charge seems to be the key to DNA substitution.

DNA, or deoxyribonucleic acid, was removed from isolated cell nuclei and, as expected, the nuclei could not make protein or nucleic acid. However, some synthetic compounds—one of them related chemically to clear plastic wrapping paper —will act as DNA substitutes.

The experiments were reported by Drs. V. G. Allfrey and A. E. Mirsky of the Rockefeller Institute at the National Academy of Sciences meeting at Berkeley, Calif.

The key to their ability to substitute for DNA seems to be the fact that the synthetic molecules form in long chains and have many repeating negative charges. Both of these are also characteristic of DNA, the scientists explained.

Although large negative molecules such as the anti-blood clotting agent heparin could substitute successfully for DNA, large electrically neutral molecules were ineffective.

They also found that positively charged substances inhibit the synthesis processes in the nucleus. Since the nucleus contains a variety of such compounds called histones, the scientists believe histones may control nuclear activity by masking DNA's negative charge. A direct test of this theory has been made, Drs. Alifrey and Mirsky reported. A histone fraction prepared from thymus cell nucleus was added to isolated thymus cell nuclei and was found to inhibit protein synthesis.

Without its DNA, the nucleus cannot make protein or nucleic acid nor can it build up an energy reserve in the form of ATP or adenosine triphosphate.

It may be possible some day to control nuclear activity in the whole living organism by administering compounds that will shift nuclear charges. "This is a hopeful aspect for research on hereditary diseases in man, many of which are essentially the result of disordered nuclear function," the scientists concluded.

Science News Letter, November 22, 1958

ASTRONOMY

Top Astronomy Events

The most important events in astronomy during 1958 included intensive studies of Mars, discoveries of the nature of the Milky Way, and further improvements in observing instruments.

➤ THE TOP astronomical events of 1958 have been selected by Dr. Harlow Shapley, former director of Harvard College Observatory.

Included among the past year's highlights, he told SCIENCE SERVICE, are the following:

1. The intense study of Mars by spectrograph, photometer and radio waves, including the possibility of bouncing a radar echo from the planet as has already been done with the moon.

2. The discovery that the center region, or nucleus of the Milky Way galaxy is expanding, found from observations with the 82-foot radio telescope in Holland.

3. The suggestion that the moon's surface is a honeycomb of solidified dust, caused by the melting and frothing of its dusty surface when bombarded with meteorites.

4. The discovery of 86 stars definitely known to have magnetic fields, and another 65 stars suspected of having them.

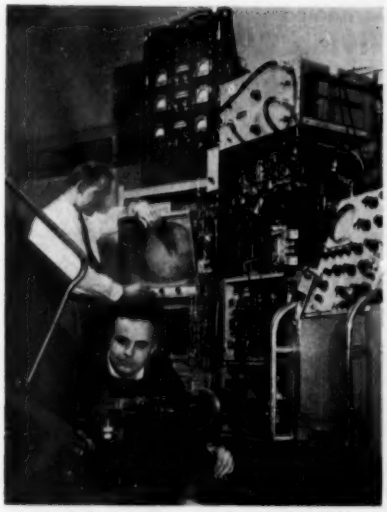
5. A more precise determination of the earth's shape resulting from measuring the depth of the ocean when atomic submarines traveled under the North Pole.

6. The start on construction of a 140-foot steerable radio telescope at the National Radio Astronomy Observatory, Green Bank, W. Va.; announcement of plans by the U.S. Navy to build one of unspecified design having an aperture more than 400 feet at nearby Sugar Grove, W. Va., and the construction by Russian scientists of a radio telescope 425 feet in diameter.

7. Good progress by Russian astronomers in construction of a 105-inch reflecting telescope that will be the world's third largest instrument when completed.

Dr. Shapley said his selections were not necessarily listed in order of their astronomical significance. He also reported that the Russians are conducting a contest for the best design of a monument to commemorate the launching of Sputnik I on Oct. 4, 1957.

Science News Letter, November 22, 1958



PARTICLE TRACKER—"Terry", a device that counts the tracks left by atomic particles, is a combination microscope, television camera and electronic computer. Prof. Paul V. C. Hough (back) and Wentworth Williams of the University of Michigan examine the device.

HEMATOLOGY

Hemoglobin Duplicated In Test Tube

➤ THE FIRST successful duplication of hemoglobin of red blood cells under "test tube" conditions has been reported.

Hemoglobin is the oxygen-carrying protein in red blood cells. It consists of 16 different amino acids. This protein was "manufactured" in a test tube by Dr. Richard S. Schweet at the City of Hope Medical Center, Duarte, Calif.

Dr. Schweet used a technique that enabled this important protein to develop free from living cells. He extracted microsomes from immature red blood cells of rabbits. Microsomes are the tiny "protein factories" within all living cells. These, in their natural state, produce hemoglobin almost exclsively.

Dr. Schweet tagged with radioactive carbon an amino acid used by microsomes in their production of hemoglobin. Then he added the other 15 amino acids.

When he was able to isolate radioactive hemoglobin from the test tube mixture, he concluded that the microsomes had used the tagged acid to manufacture the newly made hemoglobin in a cell-free system.

These findings now make it possible to study the production of a given protein in a detailed manner that was not possible before.

This research, reported in the *Proceedings of the National Academy of Sciences* (Oct.), was supported by the American Heart Association and the National Science Foundation. Mrs. Esther Allen, research assistant, also at City of Hope, and Dr. Hildegard Lamfrom, biologist at the California Institute of Technology, assisted in the project.

Science News Letter, November 22, 1958

METEOROLOGY

Flying Weather Stations Planned by Air Force

➤ PLANS to probe the world's weather with jet-borne weather stations flying at about 50,000 feet have been outlined.

The flying weather stations will continuously communicate atmospheric data to a ground network as the planes make continent-wide sweeps at close to the speed of sound.

Although data gathered is intended primarily for the Air Force's Air Weather Service, it will also be supplied to the Weather Bureau, commercial airlines and other interested agencies.

Plans are for the planes to measure cloud formation and look inside storms with radar sweeps extending 150 miles from the aircraft. At intervals, rockets will be launched to investigate the jet stream and other atmospheric phenomena at altitudes up to 150,000 feet above the earth's surface.

Sensing equipment will also be dropped by parachute to obtain data closer to earth.

The University of Michigan meteorological laboratories and Bendix Aviation Corporation co-sponsored the meeting in Ann Arbor attended by some 150 scientists.

Science News Letter, November 22, 1958

CHEMISTRY

Suspect "Human" Life On Millions of Planets

➤ MILLIONS of planets in the known universe probably support life similar to that on earth, Dr. Melvin Calvin, a University of California chemist, believes.

Speaking at inaugural ceremonies for University of Washington President Charles Edwin Odegaard, Dr. Calvin cited recent development of knowledge about how inorganic molecules can be transformed into complex organic molecules by radiation, electricity and ultraviolet light.

Chemical knowledge is now such, he said, that given the starting materials of the primordial earth the course of chemical evolution from inorganic materials up to and through the formation of a living cell was predictable and inevitable. The evolution of higher forms of life could also have been predicted, but the precise pathways could not be predetermined. Thus, Dr. Calvin said, plants and animals were inevitable developments although their physical appearances were not.

Dr. Calvin cited the estimates of Dr. Harlow Shapley, former director of Harvard College Observatory, that there may be 100,000,000 earth-like planets in the known universe. Each of these would have begun with comparable chemical make-ups, atmospheres and distance from an energy-giving star like the sun.

The scientist concludes that earth-like life, including plants and thinking animals like man, must have developed on millions of these planets.

The precise form of species might be different than those on earth; yet animals, for example, would have eyes, hearing apparatus and be otherwise capable of responding to an earth-like environment.

Although the planets are all presumably about the same age, evolution would not take place at the same speed on all, he said. Therefore, some animal life might be prehuman, some posthuman and some comparable to man in development.

An important implication, he said, is that life is a major cosmic influence in the universe, rather than a trivial accident on an insignificant planet, and that thinking creatures may be altering the environment of astral bodies through the universe even more profoundly than man has altered the earth.

Science News Letter, November 22, 1958

MEDICINE

Computer Aids Physicians In Circulatory Diagnoses

➤ A COMPUTER that would enable physicians to make early diagnoses of hardening of the arteries and high blood pressure has been developed by a biophysicist at Ohio State University.

A year of experimenting with it has convinced Dr. Ralph W. Stacy of the computer's value as a diagnostic instrument in detecting most circulatory diseases.

The machine can be used to measure the three mechanical properties of the arterial system: mass, elasticity and viscosity. By checking the elasticity of the circulatory system, it will be possible to foretell the onset of such cardiovascular difficulties as high blood pressure and hardening of the arteries.

The computer consists of a pulse-wave form generator, a Donner analogue computer and a cathode ray oscilloscope. Being able to digest and remember countless case histories in complete detail, the computer can be a great aid to the physician in assembling information. It would never, however, be capable of making a diagnosis by itself.

For the past year, Dr. Stacy has made graphs of pulse beats taken at the heart and at the wrist, converted them into electrical signals of the same frequency as the heart beat by the pulse-wave form generator, and fed them into the computer. The output was observed on the oscilloscope screen.

Delicate adjustments, said Dr. Stacy, make it possible to reproduce the arterial system electronically and observe how it would react under almost any given set of conditions.

He said the next step would be to obtain pulse beat graphs of patients who have been diagnosed as having an arterial ailment and to check them on the computer to determine any possible margin of error.

Development of the machine was co-sponsored by the Central Ohio Heart Association and the U. S. Department of Health, Education and Welfare in connection with the University's Research Foundation.

Science News Letter, November 22, 1958

IN SCIENC

PUBLIC HEALTH

Deer Antlers Accumulate Radioactivity in 5 Years

➤ DEER CAN offer mute testimony to the increase in radioactive fallout.

Their antlers may be good warning signals of possible danger to man.

Analysis of deer antlers indicates there has been approximately a ten-fold increase in radioactivity since 1952. Studies were made with deer that normally graze on upland pastures known to contain relatively high levels of fallout radioactivity, J. Hawthorn and R. B. Duckworth report in *Nature* (Nov. 8).

The radioactivity as measured by strontium-89 plus strontium-90 was 126 micro-microcuries per gram of calcium present in the antlers of a deer shot in November, 1957. In contrast, the strontium activity found in the antlers of a deer shot in 1952 was only 11.2 micro-microcuries per gram of calcium.

Exposure of a thin cross-section of the antlers to X-ray film resulted in a clear autoradiogram, indicating zones of high and low activity, for the more recent specimen. However, the radioactivity was too small in the 1952 specimen to yield a strong image.

The scientists, both with the department of food science at the Royal College of Science and Technology, Glasgow, Scotland, also obtained autoradiograms of grass and of a sheep's premolar tooth taken from areas known to contain high levels of radioactivity.

Science News Letter, November 22, 1958

BOTANY

Australian Trees Yield Blood Pressure Reducer

➤ THE BARKS of certain trees that grow in Australia have been found to contain substances that act as a potent blood pressure reducer.

They may prove to be more effective than the now commonly used reducer, reserpine.

The substance or substances (the exact active principle has not yet been isolated) are contained in the alkaloids extracted from the barks of trees that belong to the species *Alstonia*, Dr. R. C. Elderfield, professor of chemistry, University of Michigan, said at a Society of the Sigma Xi lecture.

The *Alstonia* species includes trees or shrubs whose leaves grow in a circle or whirl around particular points on the stem. They are native to Malaya and the Pacific islands. Their alkaloids are organic basic salts.

Science News Letter, November 22, 1958

NCE FIELDS

PHYSICS

Develop New Design For Atom Smashers

➤ A NEW DESIGN for use in high-energy atom smashers has been reported by eight scientists who developed a model of the accelerator while working at the Oak Ridge National Laboratory.

Studies with the model "strongly indicate the feasibility" of building large machines of the same type with protons instead of electrons as the accelerated particles, the scientists concluded.

The new concept for the cyclotron involves using a magnetic field that, on the average, increases with radius. Imposed on this field is another to focus the particles in a beam.

The Oak Ridge scientists dubbed their cyclotron the AVF, for azimuthally varying field. It was developed by Drs. R. E. Worsham, C. D. Goodman, R. S. Livingston, J. E. Mann, G. T. Trammel and T. A. Welton, all of Oak Ridge National Laboratory, Oak Ridge, Tenn., and Dr. H. G. Blosser, now at Michigan State University, and Dr. H. M. Moseley, on leave from Texas Christian University.

The scientists report their design of the magnetic field shape in the *Review of Scientific Instruments* (Oct.), publication of the American Institute of Physics.

Science News Letter, November 22, 1958

DENTISTRY

Gum Diseases Cause Most Tooth Loss Among Adults

➤ DISEASES of the gums cause a loss of five times as many teeth as dental decay in Americans aged 35 or over.

This means that after age 35, for every tooth lost from caries, five will be extracted due to a breakdown of tooth-supporting tissues, Dr. Evert A. Archer of Chicago reported at the 99th annual session of the American Dental Association meeting in Dallas.

These gum ailments, known as periodontal diseases, can usually be detected in the early stages when inflammation changes the healthy pink color of the gums to a red color in tissue around the neck of a tooth.

Collections of tartar on the teeth at the gum line are the major cause of gum irritation, Dr. D. Walter Cohen of Philadelphia explained at the panel discussion on gum diseases.

Impacted food, faulty mouth breathing that causes abnormal dryness in the mouth, faulty toothbrushing, and incorrect use of dental floss and toothpicks were also mentioned as causes of irritation or softening of gum tissues.

Diabetes, nutritional deficiencies, gastrointestinal disorders and certain allergies can affect gum tissues.

Raw fruit is a good "detergent" food that helps to keep the gum tissues and teeth in sound condition, Dr. Harry Roth of New York University College of Dentistry said.

Prolonged and severe stress from such habits as grinding and clenching the teeth have serious effects on the conditions of the gum tissues as well as on the teeth. In addition, when the upper and lower teeth fail to meet correctly, regular jaw movements place unbalanced pressures on gum tissues, the panel concluded.

Science News Letter, November 22, 1958

PLANT PHYSIOLOGY

Plants May Survive Heat With Diet Supplements

➤ A SMALL amount of the B vitamin riboflavin may answer the problem of growing food crops in desert regions of the world.

Scientists investigating how high temperatures kill or damage a plant have found there are several chemicals that enable heat-resistant plants to survive. One of these is riboflavin, Dr. Edwin B. Kurtz Jr. of the University of Arizona's College of Agriculture reports. A small fraction of an ounce could treat many plants.

Other chemical compounds that increase heat resistance in some plants include adenine and pyrimidines and gibberellic acid. Most of the effects of high temperature in reducing or stopping plant growth can be prevented by adding the compound, Dr. Kurtz says in *Science* (Nov. 7).

Apparently these compounds are essential metabolic compounds whose activity is seriously affected by high temperatures. If this is true, chemical control of climatic diseases of plants may be possible.

As an example of current research in the field, Dr. Kurtz describes one study of two pea plants, one heat-resistant, the other heat-susceptible. The heat-susceptible plant was found to contain the same amount of adenine at both high and low temperatures. However, the resistant variety contained double the amount of adenine at 26 degrees centigrade that it had at 14 degrees centigrade. This study points to the possibility of "adapting" peas or similar crops to cultivation in warmer environments, Dr. Kurtz explains.

Gibberellic acid was found to take the place of the cold treatment biennial plants require at the end of their first year's growth if flowering in the second year is to take place. Although the way gibberellic acid acts here is unknown, the compound may make possible extension of the normal growing range of these plants.

The implications of this research are exciting, Dr. Kurtz concludes. Knowledge of how desert plants tolerate high temperatures may help solve the world's critical food problem by "permitting agriculture to extend into new lands and by increasing yields of presently cultivated areas."

Science News Letter, November 22, 1958

BIOCHEMISTRY

Find Potato, Eggplant Inhibit Cholinesterase

➤ "SOMETHING" in potato inhibits the activity of cholinesterase.

The exact nature of the inhibitor is still unknown, a team of Iowa State College scientists report in *Science* (Nov. 7). However, it has been found to have strong inhibitory effects on test tube preparations of human plasma cholinesterase. Cholinesterase is a compound that plays an important role in the activity of the brain and nervous system.

Several plants were tested to see if they contained the inhibitor, with those in the nightshade, or Solanaceae, family giving positive results. Tissue from potato, eggplant, tomato leaves and roots, tobacco leaves and petunia leaves and flowers was found to inhibit cholinesterase activity. The inhibitory substance does not appear to be related to any of the alkaloids known in the nightshade family, nor does it react like a weak acid, phenols or other known chemical compounds in plants. It is highly water soluble, the scientists report.

Wallace H. Orgell, Kunda A. Vaidya and Paul A. Dahm of Iowa State College's department of zoology and entomology reported the research.

Science News Letter, November 22, 1958

PHYSICS

Use Electron Beam For Magnetic Writing

➤ MAGNETIC WRITING using an electron beam, particularly suitable for electronic computers, has been found feasible.

The method could also be used to make magnetic half-tone images, reports Dr. Ludwig Mayer of General Mills, Inc., Minneapolis, Minn. He says the magnetic picture so obtained would be similar to one obtained by conventional printing.

The method is based on Curie-point writing, in which the direction of magnetization in a premagnetized film is reversed by elevating the temperature. The energy of a focused electron beam is used to raise the temperature. It gives "quite well defined traces," Dr. Mayer reports in the *Journal of Applied Physics* (Oct.).

The traces can be erased magnetically. Writing speeds equal to 30,000 binary digits each second were found possible in the first experiments, and "considerably higher writing speeds" could be achieved.

The magnetically stored information could also be retrieved by electronic readout, Dr. Mayer reports.

Electronic writing of magnetic half-tone images is accomplished by controlling the size of the spots of reversed magnetization.

The magnetic film upon which information is to be stored is set up as an anode in a television tube-like device. A focused electron beam heats this film in those areas where electrons impinge. The heated areas become non-magnetic if the temperature rises above the Curie point.

Science News Letter, November 22, 1958

NUTRITION

Thanksgiving Day Revolution

Thanksgiving Day, traditional American celebration with its own foods and customs, is undergoing a startling change as advances in food technology are made.

By BENITA TALL

➤ TODAY WE tend to accept "revolution" in everything from automobiles to national politics, yet there is one revolution taking place that few persons are aware of: The revolution in a meal, the Thanksgiving Day dinner.

There has been a revolution on the farm, in the food processing factory, in the grocery store, in the kitchen and in the laboratory.

Things are no longer being done the way they used to be even in the prosaic matter of what we eat on the traditional American holiday.

Not long ago, probably within the lifetimes of most persons living now, we used to look at a Thanksgiving Day table covered with several kinds of potatoes, beans, squash, turnips and parsnips, stuffing, jellies, preserves, pies, hot breads and—the crowning glory of the table—a 25-pound turkey. And we would count the things Americans had to be thankful for, with "good," plentiful food high on the list.

In the past 50 years, however, scientists have been studying the American diet. Now it seems that while we have a plentiful food supply, we may not always eat "good" food.

By "good" food, the scientists, of course, mean food that is nutritious. In one sense all food is nutritious: it supplies the human body and its billions of functioning cells with some vitamins, some minerals and some calories. A nutritious food gives good value when you compare such things as cost with vitamins and minerals. And cost should include not only the purchase price of the food but also the amount of waste involved in preparing and eating the food and, perhaps most important, the cost in calories.

Undernourished Americans

It is in this last respect that many nutritionists feel Americans are not well-fed. Admittedly there are many persons who are underweight and undernourished. The more prevalent condition in this country, however, is that of being overweight and, often, undernourished.

Publicity concerning the problem of overweight has led to a flood of special foods, pills and regimens designed to solve the problem and again return the individual to his healthy, slender self. More important is the fact that public attention has been turned to the need for change in its eating habits.

The Thanksgiving Day table, 50 years ago and today, is a good example of this change.

The change has been a dramatic one. Not only has the amount of food consumed changed, but the kind and variety has changed too. Many factors in addition to the emphasis on solving the overweight problem have helped bring about this revolution in a meal.

Americans are no longer dependent upon local farmers or their own backyard garden for their winter supply of vegetables and fruits. Speedier transportation, improved storage methods and better food processing are responsible for bringing what were once thought of as seasonal "summer" or "spring" foods to the table even at Thanksgiving time.

Research for Nutrition

The U.S. Department of Agriculture, often working in cooperation with states and with industry, has been in the forefront of developments in the food industry in all its phases, from the farm to the dining table.

Scientists have bred new varieties of fruits and vegetables. This has meant more extensive growing areas and, eventually, the capability to provide a larger market with what had once been "luxury" produce. This is one reason why broccoli, for instance, now appears on many Thanksgiving Day tables along with the cranberries and turkey.

Another reason is the advances in the storing and shipping of food. Engineers and scientists seek to find the temperature that is just right for keeping a particular fruit or vegetable at its peak freshness until it arrives at the consumer's kitchen. They investigate the intricacies of packaging and shipping.

Growth of harmful molds and fungi is intensified under some packaging conditions, scientists have found. It even makes a difference with some fruits, for instance, if they are packed on their sides, or touching one another, or in layers, wrapped in papers or plastic, or boxed separately.

Temperature is another important factor in our changing food habits. Scientists have discovered the optimum temperatures for storing, shipping and preserving many important foods. For various foods the critical temperature may range widely and it is the scientist's job to discover how high or how low the temperature can go before undesirable chemical and physical changes take place.

Advances in growing, packaging and shipping foods means that the nutritionist now has a freer hand in calling attention to the foods that make up a wholesome diet. As persons become more familiar with "strange" foods they also become willing to venture away from the standard recipes and methods of preparation as well as more concerned with the food value of their diets.

Researchers have even found that stuffing can vary considerably in its bacterial count, depending on what foods are used in addition to the bread. White bread, in contrast to corn bread, stuffings using apricots, cranberries or other acid foods had the lowest counts.

The Thanksgiving Day table, with its leafy green vegetable, fewer starches—often now only one kind of potato is served—and sweets, is witness to the revolution in American eating habits. Even the recipe-writers are aiding and abetting the nutritionists with a flood of recipes telling the homemaker how to make less-fat gravies, sugar-less cranberry relishes, or how to prepare and roast a turkey without stuffing and yet have a "goodlooking bird."

The table may no longer groan under the weight of its holiday-time foods, but Americans will probably be better nourished when, this Thanksgiving Day, they rise from a table that had carried a lighter and more varied burden of foods.

Science News Letter, November 22, 1958

NUTRITION

Proper Eating Habits Reduce Mortality Rate

➤ THIS IS a healthy country, but contrary to popular belief, it is not the healthiest country in the world, particularly for men in their prime.

Statistics show that at 45 years of age the American male can look forward to fewer birthdays than can his contemporary in Norway, The Netherlands, Denmark, Italy, Canada, New Zealand, Sweden, Switzerland, England and Wales, Dr. Fredrick J. Stare, chairman of the department of nutrition at Harvard School of Public Health, told the National Food Conference meeting in Washington, D. C.

American males past the age of 45 rank tenth in overall mortality among a list of 17 countries from which data are available. Middle-aged men in the U. S. have the highest death rate from diabetes, cardiovascular and kidney diseases of the countries studied.

Good food in the quantity to maintain desirable weight and in the proper quality to nourish the body well was one step toward longer life. This includes reducing for the obese, a high mortality factor.

Another tip to longer life is a sound, good breakfast which means at least two solids at the meal, Dr. Stare said.

Some food fallacies can be "extremely dangerous, causing people to deny themselves and their families competent medical treatment that might restore them to health," he stated.

Science News Letter, November 22, 1958

ROCKETS AND MISSILES

Satellites, Rockets Give Picture of Atmosphere

➤ SATELLITES and rockets are giving a new picture of the earth's upper atmosphere, Dr. John W. Townsend Jr. of the Naval Research Laboratory, Washington, reported.

He told an international symposium on space meeting in San Antonio, Texas, that the relative amounts of chemicals making up the air remain essentially constant from ground level to about 60 miles. Above this altitude, physical and photochemical effects change the character of the atmosphere.

Above several hundred miles, Dr. Townsend reported, the earth's atmosphere gradually merges with the atmosphere of the sun and of local space.

Science News Letter, November 22, 1958

ARCHAEOLOGY

Lake Titicaca Site Dates To Pre-Christian Times

➤ LAKE TITICACA between Bolivia and Peru in South America has been an important center of upland Indian population for thousands of years.

Definite radiocarbon chronology reported to the American Philosophical Society meeting in Philadelphia by Dr. Alfred Kidder, II, associate director of the University Museum, Philadelphia, shows that even before men knew how to make pots, they were gathering fish from this great lake.

Important early site on the Bolivian side of the lake is Chiripa. An ancient village there with double-walled houses and sliding doors was dated by Dr. Kidder as about 500 B.C. Below these ancient remains were found the simpler houses of an even earlier people.

The great site of Tiahuanaco, famous as the probable hub of widespread influence in the days before the Incas, has now been dated back to early Christian times by the radiocarbon method.

On the Peruvian side of the lake, the Pucara culture was found to be somewhat earlier than Tiahuanaca, Dr. Kidder reported. An even earlier culture, called Galuyu, was found by Dr. Kidder near Pucara. This culture, quite different from the Pucara culture and obscure in its origins, is new to archaeologists.

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Questions

ARCHAEOLOGY—Where are the recently discovered Greek ruins? p. 323.

MEDICINE—What antibiotic was given to persons in a test to determine its efficacy in preventing colds? p. 324.

PHYSICS—How is magnetic writing using an electron beam accomplished? p. 329.

Photographs: Cover and p. 323, University of Chicago; p. 325, British Information Services; p. 327, University of Michigan; p. 336, Castle Mfg. Co.

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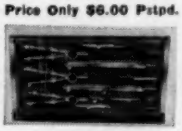

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ALASKA WILD FLOWERS—Ada White Sharples—*Stanford Univ. Press*, illus., $3.75. Reprint of 1938 edition.

ALCOHOL IN ITALIAN CULTURE: Food and Wine in Relation to Sobriety among Italians and Italian Americans—Giorgio Lolli and others—*Free Press* and *Yale Center of Alcohol Studies*, 140 p., $4. Scientific study of drinking patterns.

THE AMERICAN LABOR FORCE: Its Growth and Changing Composition—Gertrude Bancroft—*Wiley* for the Social Science Research Council, 256 p., $7.50. Detailed examination of the vast changes that have occurred, particularly in the last two decades.

ANGLER'S GUIDE TO THE SALT WATER GAME FISHES: Atlantic and Pacific—Edward C. Migdalski—*Ronald*, 506 p., illus., $7.50.

BEGINNERS' BOOK OF ASTRONOMY—John Sternig—*McBride Co. (Taplinger Pub. Co.)* 162 p., illus., $3.75. Introduces young people to the "geography" of space travel.

THE BOOK OF SMALL MAMMALS—Ted S. Pettit—*Garden City Bks*, 56 p., illus. by G. Don Ray, $2.95. A picture book for the young with accurate information.

BRITISH BIRDS—F. W. Frohawk, preface by J. D. Macdonald—*Abelard-Schuman*, 256 p., illus., $5. Describes more than 200 species.

COLLEGE TEACHING BY TELEVISION—John C. Adams, C. R. Carpenter and Dorothy R. Smith, Eds.—*Am. Council on Education*, 234 p., $4. Report on a Joint Conference with Pennsylvania State University.

CREATIVE THINKING—Charles S. Whiting—*Reinhold*, 168 p., $3.95. Examines operational techniques of creative thinking, such as brainstorming.

DISEASE, LIFE, AND MAN: Selected Essays—Rudolf Virchow, transl. and introd. by Lelland J. Rather—*Stanford Univ. Press*, 273 p., $5. Ten essays touching on a wide range of Virchow's medical, scientific and philosophical interests.

EFFECT OF SURFACE ON THE BEHAVIOUR OF METALS—G. L. J. Bailey and others—*Philosophical Lib.*, 100 p., illus., $10. The latest of the refresher courses published for the members of the Institution of Metallurgists, London.

ELEMENTS OF THE UNIVERSE—Glenn T. Seaborg and Evans G. Valens—*Dutton*, 253 p., illus., $3.95. Based on a television series of ten half-hour films on the chemical elements, featuring the Nobelist.

EMOTIONAL PROBLEMS OF ADOLESCENTS—J. Roswell Gallagher and Herbert I. Harris—*Oxford Univ. Press*, 174 p., $3.50. A guide to help parents and teachers to understand normal adolescents and their everyday problems.

EMOTIONAL PROBLEMS OF CHILDHOOD—Samuel Liebman, Ed.—*Lippincott*, 176 p. $5. Directed to the medical practitioner.

ENZYMES IN BLOOD—Laurens P. White, Ed.—*N. Y. Acad. of Sciences*, Annals Vol. 75, Art. 1, 384 p., illus., paper, $5. On enzymes in white and in red blood cells, in platelets, and on the origin of serum enzymes.

THE FACE OF THE SUN—H. W. Newton—*Penguin*, 208 p., illus., paper, 85¢. On the observed features of sunspots and their associated phenomena.

GUM PLASTICS—M. Stafford Thompson—*Reinhold*, 193 p., illus., $4.50. Guide to the application of rubber-modified plastics.

HOAXES—Curtis D. MacDougall—*Dover*, rev. ed., 338 p., illus., paper, $1.75. Updated account of how forgers, swindlers and impostors have thrived on human gullibility.

I SAILED WITH RASMUSSEN—Peter Freuchen, transl. from Danish by Arnold Anderson—*Messner*, 224 p., illus., $3.95. The late author's personal story of his 14 years with the explorer.

THE ILLUSTRATED LIBRARY OF THE NATURAL SCIENCES, 4 Vols.—Am. Museum of Natural Hist., Edward M. Weyer, Jr., Ed.—*Simon & Schuster*, 3042 p., art dir. Frederick L. Hahn, $25, until Christmas $19.95. Gives the layman an instructive view of a broad field of knowledge, ranging from aardvark to X-rays of flowers, from antibiotics to snowflakes.

INTEGRAL EQUATIONS—F. Smithies—*Cambridge Univ. Press*, 172 p., paper, $4.50. Devoted entirely to non-singular linear integral equations.

THE INTEGRATION OF HUMAN KNOWLEDGE: A study of the Formal Foundations and the Social Implications of Unified Science—Oliver L. Reiser—*Porter Sargent*, 478 p., $8. Exploratory survey of a synthesis of science and philosophy.

MAN'S WORLD OF SOUND—John R. Pierce and Edward E. David, Jr.—*Doubleday*, 287 p., illus., $5. Synthesis of discoveries in acoustics, electronics and psychology related to man's use of sound in communication.

MODERN HYPNOSIS—Lesley Kuhn and Salvatore Russo, Eds., foreword by Melvin Powers, introd. by André Weitzenhoffer—*Wilshire Bk*, 349 p., $5. Anthology of contributions made in the past 25 years.

NUCLEAR METALLURGY, Vol. V: A Symposium on the Fabrication of Fuel Elements—D. R. Stenquist and others—*Metallurgical Soc. of AIME*, 84 p., illus., paper, $6. Papers on ceramic base elements, and metal base fuels and jacket components.

NUCLEAR PROCESS HEAT IN INDUSTRY—George Perazich—*Nat. Planning Assn.*, 44 p., paper, $1.25. Analysis of potential uses of nuclear reactors for the production of energy suitable for processing raw materials, rather than for electricity.

THE PEOPLE OF THE DEAD SEA SCROLLS: In Text and Pictures—John Marco Allegro—*Doubleday*, 192 p., 189 photographs, $5. Pictorial record of location and finds.

PHOSPHORUS AND ITS COMPOUNDS, Vol. I: Chemistry—John R. Van Wazer—*Interscience*, 954 p., illus., $27.50. Presents phosphorus chemistry without differentiating between the inorganic and the organic chemistry of phosphorus.

(Continued on page 334)

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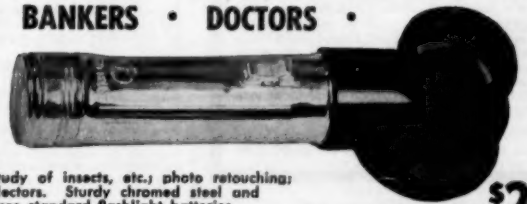

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(Continued from page 332)

POPULAR ELECTRONICS' ELECTRONIC KITS 1959—David A. Findley, Ed.—*Ziff-Davis*, 162 p., illus., paper, $1. Builder's guide and directory.

PUNCHED CARDS: Their Application to Science and Industry—Robert S. Casey and others, Eds.—*Reinhold*, 2nd ed., 697 p., $15. The rapid growth of the field is reflected in the extension of the practical applications section from 186 pp. in the 1951 edition to 295 pp.

ROCKETS, SATELLITES AND SPACE TRAVEL—Jack Coggins and Fletcher Pratt, edited by Willy Ley—*Random House*, rev. ed., 64 p., illus. by J. Coggins, $1.95. 1951 edition brought up to date.

THE RUSSIANS IN THE ARCTIC: Aspects of Soviet Exploration and Exploitation of the Far North, 1937-57—Terence Armstrong—*Essential Bks*, 182 p., illus., $4.50. Collection of accounts of events in the Soviet Arctic, based on publications in the Soviet Union.

SATELLITE DATA AND ANALYSES, Special Report No. 18—G. F. Schilling, Ed.—*Smithsonian Astrophysical Observatory*, 49 p., paper free upon request direct to publisher, Cambridge 38, Mass. Includes report on atmospheric densities from Explorer IV.

SCIENCE AND THE MODERN MIND: A Symposium—Gerald Holton, Ed.—*Beacon Press*, 110 p., $3.95. Nine essays on the influence which science has had upon our image of the universe within and around us.

SEROLOGICAL AND BIOCHEMICAL COMPARISONS OF PROTEINS—William H. Cole, *Ed.—Rutgers Univ. Press*, 119 p., illus., $2. Proceedings of the Fourteenth Annual Protein Conference.

SOILS FOR THE ARCHAEOLOGIST—I. W. Cornwall—*Macmillan*, 230 p., illus., $7.50. What the archaeologist needs to know about the matrix in which he finds his artifacts.

THE TEACHING AND LEARNING OF PSYCHOTHERAPY—Rudolf Ekstein and Robert S. Wallerstein—*Basic Bks*, 334 p., $6.50. About the theory and technique of the supervisory process in training psychiatrists.

TRIFLUOPERAZINE: Clinical and Pharmacological Aspects—Frank J. Ayd, Jr. and others, introd. by Henry Brill—*Lea & Febiger*, 219 p., $3.50. New drug proving effective in treating psychotic and neurotic disorders.

THE UFAW HANDBOOK ON THE CARE AND MANAGEMENT OF LABORATORY ANIMALS—Alastair N. Worden, and W. Lane-Petter, foreword by Sir Harold Himsworth—*Universities Federation for Animal Welfare*, 2nd ed., 951 p., illus., $10. On the efficient and humane handling of the many different species of laboratory animals.

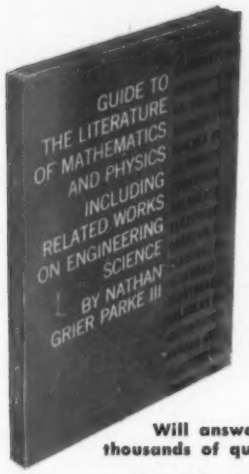
USING ELECTRONICS: A Book of Things to Make—Harry Zarchy—*Crowell*, 117 p., illus. by author, $2.50. Basic procedures and experiments.

WATER AND THE CYCLE OF LIFE—Joseph A. Cocannouer—*Devin-Adair*, 143 p., $3. On the importance of quality water to soil, plants, animals, and man.

WHAT WE DO KNOW ABOUT HEART ATTACKS—John W. Gofman—*Putnam*, 180 p., $3.50. Tells what heart disease is and explains the why and wherefore of some of the treatment and preventive measures advised by physicians.

WINTER-SLEEPING WILDLIFE—Will Barker, foreword by Ernest F. Swift—*Harper*, 136 p., illus. by Carl Burger, $3. A book on hibernation to be enjoyed by the whole family.

YOUNG THOMAS EDISON—Sterling North—*Houghton*, 182 p., illus. by William Barss, $1.95. Biography for young people.



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⚙ *CAR DOOR OPENING TOOL, used when door is locked from the inside, slips under the butterfly window. It is made of two steel strips more than 20 inches long connected at one end by a pivotal rivet. The other end of one of the strips is U-shaped for engaging the car lock button. An attached strip of spring steel is then released, snapping up the button.*

Science News Letter, November 22, 1958

⚙ *MAGNETIC HANDLE, weighing five pounds, is capable of lifting more than 300 pounds. Made of permanent Indox magnets embedded in plastic, the tool is six inches square and an inch thick. It gets its powerful attractive force from a magnetic field that extends only 1/16th of an inch.*

Science News Letter, November 22, 1958

⚙ *SELF-PROPELLED SCAFFOLDING has a crank with which a workman can move the unit from an elevated position. The scaffolding, shown in the photograph, has a safety brake for locking it in position.*

Its wooden platform can be adjusted in seven positions up to 12 feet. The whole unit can be assembled and disassembled in less than 60 seconds.

Science News Letter, November 22, 1958

⚙ *TABLEMATS, designed with water-color scenes of early America, can double as wall decorations. The mats are reversible, the opposite side being a textured, fabric-like design in a soft beige. They are 17 by 11½ inches and made of nonabsorbent plastic.*

Science News Letter, November 22, 1958

⚙ *AUTOMATIC SLIDE PROJECTOR permit slides to be advanced and moved in reverse through a remote control, hand-held unit. It has a slide holder that mechanically prevents the pictures from going out of focus. A zoom lens enables the operator to adjust the size of the picture without moving the entire projector. The unit is portable and flat in shape.*

Science News Letter, November 22, 1958

➤ *GLASS PANELS polarize light to provide glare-free illumination. A process of breaking the glass into flakes and combining it with liquid resin gives the panels their polarizing ability. The panels come in flat sheets up to 24 inches by 48 inches.*

Science News Letter, November 22, 1958

⚙ *LOW TEMPERATURE ENVIRONMENTAL TEST CHAMBER may be used in space and missile research where conditions of extreme cold must be simulated, It provides 13 cubic feet of testing volume and automatically maintains internal temperature at levels in the range of 32 degrees Fahrenheit to minus 260 degrees Fahrenheit.*

Science News Letter, November 22, 1958

Nature Ramblings

By HORACE LOFTIN

➤ WHAT GREAT impulses can lead a citizen to abandon the comforts of home and office, in the face of sly smiles and broad jokes from friends and family, to spend a cold, wet day at bird watching?

These impulses are many and varied; but to many or most of the birdwatching tribe, it is the sporting instinct that gives them the biggest shove down the path of birding from which there apparently is no return.

You see, to a large extent, birding is an exciting game, a type of "numbers game" as many play it.

According to the "birdwatchers' bible," the official Checklist of the American Ornithological Union, there are 1,686 species and subspecies of birds known from North America above the Mexican border. Any one area contains only a fraction of these birds, of course, but the eager birder wants his share of that fraction! Victory is sweet when he adds a new bird to his "life lists"—those species which he has positively

Numbers Game

identified alive and in the field. It is sweeter when the new bird is one which his companions and friendly competitors have not managed to find.

Adding "life list birds" is routine at first. But after a while the easy birds will have been marked off and hunting starts in earnest.

As the bird watcher becomes more skillful through experience, however, the "tough" species will be added to his list. Thereafter, until he makes a birding trip to another section of the country, his "life listing" will just about be halted. So the numbers game takes new directions.

Initially, the bird watcher begins to play hard to see how many kinds of birds he can positively identify in a given area in a single day. This is where skill in identification and knowledge of the habits of birds begins to pay dividends. The difference between the beginner's daily list and that of the "professional" at the game of birding is a measure of how much the expert bird watcher has learned about the ways of wild creatures.

Then there come the annual list, the spring, fall and Christmas bird counts, the breeding bird censuses, the nest hunts, the life history studies, and on and on.

The birder is as much a sportsman as the hunter or fisherman. The chief difference, perhaps, is that the birder comes to know much more about his "prey." Birding is a numbers game in which the player always wins.

Science News Letter, November 22, 1958